NOVEMBER/DECEMBER 2025

FASC32/CASC32 — QUANTITATIVE TECHNIQUES – I

Shanmuga Industries College T.V.Malai

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. What are the different types of models in OR?

2. Define Scope of Operation Research.

3. Define Linear Programming Problem.

4. Define objective function.

5. Define optimal solution.

6. Write about the methods for finding initial basic feasible solution.

7. Define feasible solutions.

8. Write mathematical formulation of Transportation Problem.

9. Define Cost matrix.

10. Define balanced and unbalanced Assignment Problem.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL the questions.

11. (a) Write the Significance of Operation Research.

Or

(b) Write about the Nature of operation research.

12. (a) Describe Characteristics of Linear Programming Problem.

Or

(b) Write an algorithm for solving LPP using graphical method.

20. Solve the assignment problem.

	I	II	III	IV
A	18	26	17	11
B	13	28	14	26
C	38	19	18	15
D	19	26	24	10

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13. (a) Write the steps for solving LPP using Big-M method.

Or

(b) Write the procedure for North West Corner method.

14. (a) Obtain the initial basic feasible solution to the problem

	A	B	C	D	Supply
	5	3	6	2	19
	4	7	9	1	37
	3	4	7	5	34
Demand	16	18	31	25	

Or

(b) Solve transportation problem.

	1	2	3	4	Supply
I	3	7	6	4	5
II	2	4	3	2	2
III	4	3	8	5	3
Demand	3	3	2	2	

15. (a) Solve Assignment method.

	I	II	III	IV
A	12	30	21	15
B	16	33	9	31
C	44	25	24	21
D	23	30	28	14

Or

(b) Solve the following assignment problem

Item	I	II	III	IV
A	15	5	4	15
B	12	2	10	12
C	16	3	5	16
D	17	3	4	17

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Give the applications of operations research and explain in detail.

17. Solve the following LPP using graphical method

Maximization $Z = x_1 + x_2$

Subject to the constraints

$$5x_1 + 3x_2 \leq 15$$
$$x_1 + x_2 \geq 6$$
$$x_1, x_2 \geq 0.$$

18. Obtain IBFS using North-west corner rule

Job	1	2	3	4	Supply
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Demand	200	225	275	250	

19. Solve the transportation problem.

	1	2	3	4	Supply
I	3	7	6	4	5
II	2	4	3	2	2
III	4	3	8	5	3
Demand	3	3	2	2	